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RF Exposure Report

Test Report Number	STA-25011432-LC-FCC-IC-MPE
FCC ID	N6C-SDMAX
ISED ID	4908A-SDMAX
Applicant	Silex technology, Inc.
Applicant Address	2-3-1 Hikaridai, Seika-cho, Kyoto 619-0237, Japan
Product Name	Embedded Wireless Module
Model Number	SX-SDMAX
Date of Receipt	02/18/2025
Date of Test	03/14/2025 - 04/09/2025
Report Issue Date	04/10/2025
Test Standards	47 CFR §1.1307(b), 47 CFR §1.1310 RSS-102 Issue 6 Dec 2023
Test Result	**PASS**

Issued by:

Vista Compliance Laboratories
1261 Puerta Del Sol, San Clemente, CA 92673 USA
www.vista-compliance.com

Lining

Lining Li (Test Engineer)

David Zhang (Technical Manager)

REVISION HISTORY

Report Number	Version	Description	Issued Date
STA-25011432-LC-FCC-IC-MPE	01	Initial report	04/10/2025

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1 General Information

1.1 Applicant

Applicant	Silex technology,Inc.
Applicant Address	2-3-1 Hikaridai, Seika-cho, Kyoto 619-0237, Japan
Manufacturer	Silex technology,Inc.
Manufacturer Address	2-3-1 Hikaridai, Seika-cho, Kyoto 619-0237, Japan

1.2 Product information

Product Name	Embedded Wireless Module
Model Number	SX-SDMAX
Family Models	N/A
Serial Number	1CBCEC3064CA
Frequency Band	Bluetooth_Classic: 2402-2480MHz BLE: 2402-2480MHz WLAN 2.4G: 2412-2462MHz WLAN 5G: 5180-5240MHz, 5260-5320MHz 5500-5720MHz, 5725-5825MHz
Type of modulation	GFSK, π/4DQPSK, 8DPSK for Bluetooth Classic GFSK for BLE CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM 256QAM for OFDM in 11ac mode 1024QAM for OFDMA in 11ax mode
Equipment Class	DSS, DTS, NII
Antenna Information	4-in-1 4G/5G MiMo IOT Antenna (It contains 4 antennas, but only one can be used for 2.4G/5G) Peak Gain: 5 dBi for 2.4 GHz, 6 dBi for 5 GHz
Clock Frequencies	N/A
Input Power	3.3VDC
Power Adapter Manufacturer/Model	N/A
Power Adapter SN	N/A
Hardware version	N/A
Software version	N/A
Additional Info	N/A

1.3 Test standard and method

Test standard	47 CFR §1.1307(b), 47 CFR §1.1310 RSS-102 Issue 6 Dec 2023
Test method	47 CFR §1.1307(b), 47 CFR §1.1310 RSS-102 Issue 6 Dec 2023

2 Test Site Information

Lab performing tests	Vista Laboratories, Inc.
Lab Address	1261 Puerta Del Sol, San Clemente, CA 92673 USA
Phone Number	+1 (949) 393-1123
Website	www.vista-compliance.com

3 FCC RF Exposure Evaluation

3.1 Limits for Maximum Permissible Exposure (MPE)

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm^2)	Average Time (minutes)
Limits For General Population / Uncontrolled Exposure				
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	($180/f^2$)*	30
30-300	27.5	0.073	0.2	30
300-1500	…	…	f/1500	30
1500-100,000	…	…	1.0	30

f = Frequency in MHz; *Plane-wave equivalent power density

3.2 MPE Calculation Formula

Equation: $S = PG / 4\pi R^2$ or $R = \sqrt{PG / 4\pi S}$

Where, S = Power Density

P = Power Input to Antenna

G = Antenna Gain

R = distance to the center of radiated antenna in cm

3.3 Classification

The antenna of this product, under normal use condition, is at least 20cm away from the body of the user. So, this device is classified as Mobile Device.

3.4 Antenna Gain

Please see section 1.2 product information for antenna gain details.

3.5 FCC RF Exposure Evaluation Results

Band	Conducted Average Output Power (mW)	Antenna Gain (dBi)	Separation distance (cm)	Power Density (mW/cm^2)	MPE Limit (mW/cm^2)
Bluetooth	4.436	5	20	0.00279	1
WLAN 2.4G	67.92	5	20	0.04272	1
WLAN 5G	43.752	6	20	0.03465	1

The above results show that the device complies with the MPE requirement.

4 ISED RF Exposure Evaluation

4.1 Limits for Maximum Permissible Exposure (MPE)

1. Per RSS-102 issue 5, section 2.5.2 as reproduced below:

2.5.2 Exemption from Routine Evaluation Limits – RF Exposure Evaluation

RF exposure evaluation is required if the separation distance between the user and/or bystander and the device's radiating element is greater than 20 cm, except when the device operates as follows:

- Below 20 MHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 1 W (adjusted for tune-up tolerance);
- At or above 20 MHz and below 48 MHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than $22.48/f^{0.5}$W (adjusted for tune-up tolerance), where f is in MHz;
- At or above 48 MHz and below 300 MHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 0.6 W (adjusted for tune-up tolerance);
- At or above 300 MHz and below 6 GHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than $1.31 \times 10^{-2}\ f^{0.6834}$ W (adjusted for tune-up tolerance), where f is in MHz;
- At or above 6 GHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 5 W (adjusted for tune-up tolerance).

In these cases, the information contained in the RF exposure technical brief may be limited to information that demonstrates how the e.i.r.p. was derived.

Frequency Range (MHz)	Electric Field Strength (V/m rms)	Magnetic Field Strength (A/m rms)	Power Density (W/m^2)	Reference Period (minutes)
Limits For General Population / Uncontrolled Exposure				
0.003-10[21]	83	90	-	Instantaneous*
0.1-10	-	$0.73/f$	-	6**
1.1-10	$87/f^{0.5}$	-	-	6**
10-20	27.46	0.0728	2	6
20-48	$58.07/f^{0.25}$	$0.1540/f^{0.25}$	$8.944/f^{0.5}$	6
48-300	22.06	0.05852	1.291	6
300-6000	$3.142\ f^{0.3417}$	$0.008335\ f^{0.3417}$	$0.02619 f^{0.6834}$	6
6000-15000	61.4	0.163	10	6
15000-150000	61.4	0.163	10	$616000/f^{1.2}$
150000-300000	$0.158\ f^{0.5}$	$4.21 \times 10^{-4}\ f^{0.5}$	$6.67 \times 10^{-5}\ f$	$616000/f^{1.2}$

Note: f is frequency in MHz.
*Based on nerve stimulation (NS).
** Based on specific absorption rate (SAR).

4.2 MPE Calculation Formula

Pd = (Pout*G) / (4*pi*r^2)

Where

Pd = power density in mW/cm^2

Pout = output power to antenna in mW

G = gain of antenna in linear scale

Pi = 3.1416

R = distance between observation point and center of the radiator in cm

4.3 Classification

The antenna of this product, under normal use condition, is at least 20cm away from the body of the user. So, this device is classified as Mobile Device.

4.4 Antenna Gain

Please see section 1.2 product information for antenna gain details.

4.5 ISED RF Exposure Evaluation Results

Band (MHz)	Conducted Average Output Power (mW)	Antenna Gain (dBi)	Separation distance (cm)	Power Density (W/ m^2)	MPE Limit (W/ m^2)
Bluetooth	4.436	5	20	0.00279	5.35
WLAN 2.4G	67.92	5	20	0.04272	5.37
2. WLAN 5G	43.752	6	20	0.03465	9.01

The above results show that the device complies with the ISED MPE requirement.

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